



National Heart, Lung, and Blood  
Institute

<http://www.nhlbi.nih.gov>

**EMBARGOED FOR RELEASE**  
Wednesday, February 25, 2009  
5 p.m. ET

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### **Heart-Healthy, Reduced-Calorie Diets Promote Long-term Weight Loss Regardless of Fat, Protein, and Carbohydrate Content**

Heart-healthy diets that reduce calorie intake—regardless of differing proportions of fat, protein, or carbohydrate—can help overweight and obese adults achieve and maintain weight loss, according to a study funded by the National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health, and published Feb., 26, 2009, in the *New England Journal of Medicine*.

Researchers from the Preventing Overweight Using Novel Dietary Strategies (POUNDS LOST) study found similar weight loss after six months and two years among participants assigned to four diets that differed in their proportions of these three major nutrients. The diets were low or high in total fat (20 or 40 percent of calories) with average or high protein (15 or 25 percent of calories). Carbohydrate content ranged from 35 to 65 percent of calories. The diets all used the same calorie reduction goals and were heart-healthy—low in saturated fat and cholesterol while high in dietary fiber.

On average, participants lost 13 pounds at six months and maintained a 9 pound loss at two years. Participants also reduced their waistlines by 1 to 3 inches by the end of the study. Craving, fullness, hunger, and diet satisfaction were all similar across the four diets.

“These results show that, as long as people follow a heart-healthy, reduced-calorie diet, there is more than one nutritional approach to achieving and maintaining a healthy weight,” said Elizabeth G. Nabel, M.D., director, NHLBI. “This provides people who need to lose weight with the flexibility to choose an approach that they’re most likely to sustain—one that is most suited to their personal preferences and health needs.”

In the POUNDS LOST study, 811 overweight and obese adults aged 30 to 70 were assigned to one of four diets, and asked to record their food intake in a diary or an online tool that showed how intake compared with goals. Group diet counseling sessions were held at least twice per month throughout the two years of the study, and individual sessions were held every eight weeks. Participants were given personalized

calorie goals, ranging from 1,200 to 2,400 calories per day, which reduced their overall caloric intake as compared with their daily energy requirement. All participants were asked to do moderate-intensity physical activity, such as brisk walking, for at least 90 minutes per week. Study participants were diverse in gender and ethnicity, with 38 percent men and 22 percent representing minorities. Participants did not have diabetes or severe heart disease but could have had other risk factors, such as high blood pressure or high cholesterol.

Overweight is defined by having a body mass index (BMI)—a calculation of the relationship between weight and height—greater than 25 and less than 30. Those with a BMI of 30 or higher are considered to be obese. Sixty-six percent of American adults are overweight and of those, 32 percent are obese, according to the Centers for Disease Control and Prevention.

Research was conducted in Boston at Harvard University School of Public Health and at the Pennington Biomedical Research Center of Louisiana State University in Baton Rouge, La. Diets were adapted during sessions to the diverse cuisines from these two regions of the country.

“We were encouraged that, in addition to achieving and maintaining weight loss, study participants experienced other positive health changes as well,” said Catherine M. Loria, Ph.D., a nutritional epidemiologist at NHLBI and co-author of the study. “The findings emphasize the importance of weight loss in reducing heart disease risk.”

All diets improved risk factors for cardiovascular disease at both six months and two years in ways consistent with previous studies. Improved risk factors include reduced levels of triglycerides, LDL (bad) cholesterol, lowered blood pressure, and increased HDL (good) cholesterol. All diets decreased the presence of metabolic syndrome, a cluster of related conditions, overweight, high triglycerides, high blood sugar, high blood pressure, and low HDL cholesterol, which increases heart disease risk.

Previous studies have shown that a loss of 5 to 10 percent of body weight will help reduce risk factors for heart disease and other medical conditions. In this study, 15 percent of patients achieved a 10 percent weight loss after two years.

“This new information should focus weight loss approaches on reducing calorie intake rather than any particular proportions of fat, protein or carbohydrate. This is important information for health professionals who prescribe weight loss for their patients, and for adults who are seeking ways to sustain a healthful eating pattern,” said Frank M. Sacks, M.D., principal investigator of POUNDS LOST and Professor of Cardiovascular Disease Prevention in the Nutrition Department at the Harvard School of Public Health.

The target nutrient compositions of the four diets were:

- Low-fat, average protein: 20 percent fat, 15 percent protein, 65 percent carbohydrate
- Low-fat, high protein: 20 percent fat, 25 percent protein, 55 percent carbohydrate
- High-fat, average protein: 40 percent fat, 15 percent protein, 45 percent carbohydrate
- High-fat, high-protein: 40 percent fat, 25 percent protein, 35 percent carbohydrate

While the design of the POUNDS LOST study called for physical activity targets to be set at 90 minutes per week, many people need more physical activity in order to achieve their weight loss goals. For more information, see the 2008 Physical Activity Guidelines for Americans at [www.health.gov/paguidelines](http://www.health.gov/paguidelines).

Further information about this trial (NCT00072995) can be found at [www.clinicaltrials.gov](http://www.clinicaltrials.gov).

Part of the National Institutes of Health, the National Heart, Lung, and Blood Institute (NHLBI) plans, conducts, and supports research related to the causes, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases; and sleep disorders. The Institute also administers national health education campaigns on women and heart disease, healthy weight for children, and other topics. NHLBI press releases and other materials are available online at [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov).

The National Institutes of Health — The Nation's Medical Research Agency — includes 27 Institutes and Centers and is a component of the U.S. Department of Health and Human Services. It is the primary federal agency for conducting and supporting basic, clinical and translational medical research, and it investigates the causes, treatments, and cures for both common and rare diseases. For more information about NIH and its programs, visit [www.nih.gov](http://www.nih.gov).

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#### Resources:

- Diseases and Conditions Index: Overweight and Obesity:  
[http://www.nhlbi.nih.gov/health/dci/Diseases/obe/obe\\_whatare.html](http://www.nhlbi.nih.gov/health/dci/Diseases/obe/obe_whatare.html)
- Aim for a Health Weight Resources:  
[http://www.nhlbi.nih.gov/health/public/heart/obesity/lose\\_wt/index.htm](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/index.htm)
- NHLBI DASH Menu Planner:  
<http://hp2010.nhlbihin.net/menuplanner/menu.cgi>
- Learn About Overweight and Obesity:  
<http://www.healthfinder.gov/prevention/ViewTopic.aspx?topicID=29&areaID=0>